PATENTS

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

Jean-Pierre MARTEL et al. Docket No.: BDL-53

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For: PROCESS AND APPARATUS FOR THE INTEGRAL UTILIZATION OF OIL-PRODUCING DRUPES, PARTICULARLY OLIVES, AND SPECIFIC PRODUCTS OBTAINED

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Assistant Commissioner of Patents
Washington, D. C. 20231

PRELIMINARY AMENDMENT

SIR:

Please amend the above-identified application as follows:

IN THE CLAIMS:

Please amend claims 3-7, 9, 10, 12, 13, 15-18, 20, and 21 as follows:

3. (Amended) The process according to claim 1 wherein the controlled preheating or heating of the drupes, limited to the water contained in the drupe pulp, is effected by microwave emission so that the temperature reached by the water contained in the pulp is sufficient to favor the rapid or virtually instantaneous evaporation of a fraction of said water in the above-mentioned evaporation step b), the heating or preheating preferably being effected in the heating or preheating enclosure so that the temperature reached by the water contained in the mesocarp is in the order of 80°C to 90°C.

4. (Amended) The process according to one of claim 1 wherein the heated or preheated whole drupes are transferred, preferably immediately, into an evaporation enclosure maintained at a pressure below atmospheric pressure, preferably at a pressure below about 100 hectopascals and particularly preferably at between 50 and 100 HPa, in which the above-mentioned evaporation of at least part of the water contained in the pulp produces the above-mentioned cellular destructuring with incipient formation of a purée containing the oil, with cooling, and the remaining water and cellular tissues resulting from the burst or disaggregated pulp, together with the whole stones and the skins.

5. (Amended) The process according to one of claim 1 wherein the destructured pulp or purée, on the one hand, and the whole stones and the skins, on the other, are separated in a separator or refiner advantageously comprising a rotary screen, preferably protected from the air and especially under a partial vacuum or an inert atmosphere, said separator or refiner completing, advantageously by means of agitation or mechanical friction, the physical refining of the cellular tissues of the pulp and the release and coalescence of the oily formations contained in the destructured pulp, and advantageously completing the physical separation of the destructured tissues of the pulp remaining on the stones.

6. (Amended) The process according to one of claim 1 wherein the whole pulp in the form of purée resulting from its cellular destructuring, separated from the stones and skins, is subjected to a separation of the solid phase, the aqueous phase, if still present, and the oily phase by means of any known system, such as pressure, decantation or centrifugation, to give a drupe pulp oil which is essentially pure and essentially devoid of stone oil, kernel oil and skin oil, and which is also substantially devoid of the flavors and tastes peculiar to them, this

complementary separation advantageously being carried out after the whole pulp purée has passed through a heat exchanger, which controls the temperature of the purée and/or effects a complementary controlled dehydration to substantially completely remove the remaining aqueous phase by evaporation.

7. (Amended) The process according to one of claim 1 wherein the stones, on the one hand, and the skins, on the other, are separated from the drupes by any physical means of separation, and particularly by means of any appropriate device such as a process involving meshes of appropriate size, and/or by processes involving vibration and/or ventilation, especially with air, this separation preferably taking place after the stones and skins have been dried.

9. (Amended) The process according to any one of claim 2 wherein the most volatile compounds of the natural odor of the oil-producing drupes, which volatilize in the evaporation enclosure maintained under low pressure, are recovered, especially by being condensed and concentrated continuously at the outlet of the evaporation enclosure, it advantageously being possible for at least part of these most volatile compounds, recovered, condensed and concentrated in this way, optionally to be reintroduced into the finished product, according to different consumers' tastes.

10. (Amended) The process according to claim 1 wherein the oil-producing drupes processed are selected from the group consisting of olives, oil-palm drupes and avocados.

12. (Amended) The apparatus according to claim 11 wherein the device (20) for preheating or heating the whole drupes (I) comprises means of heating with the aid of microwave emitters, which are intended to heat the water contained at least

13. (Amended) A drupe pulp oil of improved purity, particularly an olive pulp oil, which is essentially devoid of stone oil contained in the kernel, and which contains the natural antioxidants present in olive oil, especially by being prepared with protection from oxidation, particularly from atmospheric oxygen, this olive pulp oil being obtainable by the process as defined in claim 1 or using the olive processing apparatus as defined in claim 11.

15. (Amended) A drupe kernel oil, particularly olive kernel oil, obtainable by carrying out the process according to claim 1 or using the apparatus according to claim 11 and advantageously flavored with at least part of the recovered natural flavors of the pulp.

16. (Amended) A drupe pulp paste, particularly olive pulp paste, obtainable by the process according to claim 1 or using the apparatus according to claim 11 and advantageously flavored with at least part of the recovered natural flavors of the pulp.

17. (Amended) Volatile aromatic compounds or flavors recovered from drupes, particularly olives, oil-palm drupes or avocado drupes, obtainable by the process according to claim 1 or using the apparatus according to claim 11.

18. (Amended) The use of the drupe pulp oil and particularly the olive pulp oil as defined in claim 12 or the drupe kernel oil and particularly the olive kernel oil according to claim 14, as a foodstuff or a cosmetic or pharmaceutical product.

20. (Amended) The use of the woody shells of the stones as a fuel or for the manufacture of an abrasive or a filler, advantageously after mechanical micronization, these woody shells preferably being such as obtained by the process according to claim 1 or using the processing apparatus according to claim 11.

21. (Amended) The use of the kernel press cake as a food source and active principle as obtained according to claim 1 or using the processing apparatus according to claim 11.

REMARKS

The above amendments to the claims are for fee calculation purposes only.

Respectfully submitted,

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3. The process according to claim 1 ~~or 2~~ wherein the controlled preheating or heating of the drupes, limited to the water contained in the drupe pulp, is effected by microwave emission so that the temperature reached by the water contained in the pulp is sufficient to favor the rapid or virtually instantaneous evaporation of a fraction of said water in the above-mentioned evaporation step b), the heating or preheating preferably being effected in the heating or preheating enclosure so that the temperature reached by the water contained in the mesocarp is in the order of 80°C to 90°C.

4. The process according to one of claims 1 ~~to 3~~ wherein the heated or preheated whole drupes are transferred, preferably immediately, into an evaporation enclosure maintained at a pressure below atmospheric pressure, preferably at a pressure below about 100 hectopascals and particularly preferably at between 50 and 100 HPa, in which the above-mentioned evaporation of at least part of the water contained in the pulp produces the above-mentioned cellular destructuring with incipient formation of a purée containing the oil, with cooling, and the remaining water and cellular tissues resulting from the burst or disaggregated pulp, together with the whole stones and the skins.

5. The process according to one of claims 1 ~~to 4~~ wherein the destructured pulp or purée, on the one hand, and the whole stones and the skins, on the other, are separated in a separator or refiner advantageously comprising a rotary screen, preferably protected from the air and especially under a partial vacuum or an inert atmosphere, said separator or refiner completing, advantageously by means of agitation or mechanical friction, the physical refining of the cellular tissues of the pulp and the release and coalescence of the oily formations contained in the destructured pulp, and advantageously completing the physical separation of the destructured tissues of the pulp remaining on the stones.

6. The process according to one of claims 1 ~~to 5~~ wherein the whole pulp in the form of purée resulting from its cellular destructuring, separated from the stones and skins, is subjected to a separation of the solid phase, the aqueous phase, if still present, and the oily phase by means of any known system, such as pressure, decantation or centrifugation, to give a drupe pulp oil which is essentially pure and essentially devoid of stone oil, kernel oil and skin oil, and which is also substantially devoid of the flavors and tastes peculiar to them, this

complementary separation advantageously being carried out after the whole pulp purée has passed through a heat exchanger, which controls the temperature of the purée and/or effects a complementary controlled dehydration to substantially completely remove the remaining aqueous phase by evaporation.

7. The process according to one of claims 1 [~~to 6~~] wherein the stones, on the one hand, and the skins, on the other, are separated from the drupes by any physical means of separation, and particularly by means of any appropriate device such as a process involving meshes of appropriate size, and/or by processes involving vibration and/or ventilation, especially with air, this separation preferably taking place after the stones and skins have been dried.

9. The process according to any one of claims 2 [~~to 8~~] wherein the most volatile compounds of the natural odor of the oil-producing drupes, which volatilize in the evaporation enclosure maintained under low pressure, are recovered, especially by being condensed and concentrated continuously at the outlet of the evaporation enclosure, it advantageously being possible for at least part of these most volatile compounds, recovered, condensed and concentrated in this way, optionally to be reintroduced into the finished product, according to different consumers' tastes.

10. The process according to ~~any one of~~ claims 1 [~~to 9~~] wherein the oil-producing drupes processed are selected from the group consisting of olives, oil-palm drupes and avocados.

FEUILLE DE REMPLACEMENT

12. The apparatus according to claim 11 wherein the device (20) for preheating or heating the whole drupes (1) comprises means of heating with the aid of microwave emitters, which are intended to heat the water contained at least in the drupe pulp to a temperature of between 80 and 90°C, the above-mentioned sealed enclosure ~~for each of the above-mentioned devices preferably being as defined in any one of claims 2 to 10~~.

13. A drupe pulp oil of improved purity, particularly an olive pulp oil, which is essentially devoid of stone oil contained in the kernel, and which contains the natural antioxidants present in olive oil, especially by being prepared with protection from oxidation, particularly from atmospheric oxygen, this olive pulp oil being obtainable by the process as defined in ~~any one of~~ claims 1 ~~to 10~~ or using the olive processing apparatus as defined in claim 11 ~~or 12~~.

15. A drupe kernel oil, particularly olive kernel oil, obtainable by carrying out the process according to ~~any one of~~ claims 1 ~~to 10~~ or using the apparatus according to claim 11 ~~or 12~~ and advantageously flavored with at least part of the recovered natural flavors of the pulp.

16. A drupe pulp paste, particularly olive pulp paste, obtainable by the process according to ~~any one of~~ claims 1 ~~to 10~~ or using the apparatus according to claim 11 ~~or 12~~, and advantageously flavored with at least part of the recovered natural flavors of the pulp.

17. Volatile aromatic compounds or flavors recovered from drupes, particularly olives, oil-palm drupes or avocado drupes, obtainable by the process according to ~~one of~~ claims 1 ~~to 10~~ or using the apparatus according to claim 11 ~~or 12~~.

18. The use of the drupe pulp oil and particularly the olive pulp oil as defined in claim 12 ~~or 13~~, or the drupe kernel oil and particularly the olive kernel oil according to claim 14, as a foodstuff or a cosmetic or pharmaceutical product.

20. The use of the woody shells of the stones as a fuel or for the manufacture of an abrasive or a filler, advantageously after mechanical micronization, these woody shells preferably being such as obtained by the process according to ~~one of~~ claims 1 ~~to 10~~ or using the processing apparatus according to claim 11 ~~or 12~~.

21. The use of the kernel press cake as a food source and active principle as obtained according to ~~one of~~ claims 1 ~~to 10~~ or using the processing apparatus according to claim 11 ~~or 12~~.